BUSINESS PROCEEDINGS

OF THE

AMERICAN INSTITUTE

OF

ELECTRICAL ENGINEERS,

ANNUAL MEETING, MAY 17TH,

AND SPECIAL MEETING, JUNE 28TH, 1887.

NEW YORK CITY:

PUBLISHED BY THE INSTITUTE,

AT THE OFFICE OF THE SECRETARY,

16 DEY STREET.

OFFICERS AND MEMBERS OF THE COUNCIL.

1887-8.

PRESIDENT:

T. COMMERFORD MARTIN,
Term expires 1888.

PAST-PRESIDENTS:

DR. NORVIN GREEN, 1884-5-6.
FRANK L. POPE, 1886-7.

VICE-PRESIDENTS:

DR. NORVIN GREEN,
Term expires 1888.

PROF. ELIHU THOMSON,
Term expires 1888.

GEORGE C. MAYNARD,
Term expires 1888.

FRANK L POPE,
Term expires 1889.

COL. ROWLAND R. HAZARD,
Term expires 1889.

PROF. W. A. ANTHONY,
Term expires 1889.

MANAGERS:

CHARLES L. BUCKINGHAM,
Term expires 1888.

PROF. B. F. THOMAS,
Term expires 1888.

DAVID BROOKS,
Term expires 1888.

EDWARD P THOMPSON,
Term expires 1888.

CAPTAIN O. E. MICHAELIS, U.S.A.
Term expires 1889.

PROF. CYRUS F. BRACKETT,
Term expires 1889.

C. O. MAILLOUX,
Term expires 1889.

SCHUYLER S. WHEELER,
Term expires 1890.

JOSEPH WETZLER,
Term expires 1890.

A. C. FOWLER,
Term expires 1890.

WILLIAM LEE CHURCH,
Term expires 1890.

TREASURER:

GEORGE M. PHELPS, JR., 11 Wall Street, New York.
Term expires 1888.

SECRETARY:

RALPH W. POPE, 16 Dey Street, New York.
Term expires 1888.

Copies of the Rules, application blanks, membership lists and general information regarding the Institute may be obtained by addressing the Secretary.

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AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS.

Annual Meeting.

May 17th, 1887.

The Annual Meeting was called to order at the house of the American Society of Civil Engineers, 127 East 23d Street, New York, at 8.45 P. M., by the President of the Institute, Mr. Frank L. Pope.

The President:—We have met this evening to hold the fourth annual meeting of the American Institute of Electrical Engineers, for the election of officers for the ensuing year and the transaction of any other business that may come before the meeting. The first thing on the order of business is the reading of the reports. The Secretary, I think, has his report ready.

Captain O. E. Michaelis:—Might it not perhaps save time if a motion were now made to appoint a committee to select names to present for the vacant offices, so that they might retire and make up their list and present it when the time comes?

The President:—I will accept that as a motion if any member will second it.

The motion was seconded and carried.

The President:—I will appoint on that Committee, Captain O. E. Michaelis, Mr. Geo. M. Phelps, Jr., and Mr. Joseph Wetzler.

The Secretary:—Mr. President, before the Committee withdraws I will read a list of the retiring officers for their information. The retiring officers, according to the by-laws, are, F. L. Pope, President; F. W. Jones and D. H. Bates, Vice-presidents, who retire according to the by-laws by the expiration of their terms of office; Mr. T. D. Lockwood, elected vice-president last year

has resigned. The resignation was held over by the Council, but the gentleman insists upon resigning, because he is so situated that he cannot perform the active duties of the office, and he claims that his platform is, that an officer should be an active agent, and he cannot be consistent in that position unless he retires himself. Professor W. A. Anthony, elected to fill a short term in place of F. L. Pope, who was elected President last year, That makes four vice-presidents to be elected. The retiring managers are, C. F. Brush, Prof. E. J. Houston, T. C. Martin and Edward Weston. The other officers, whose terms expire, are, Treasurer R. R. Hazard; Secretary R. W. Pope.

The Secretary then read his report as follows:

Secretary's Report.

To the President and Members of the American Institute of Electrical Engineers.

As the Institute is about entering upon its fourth year, it appears to be an appropriate time to review its record, examine the field of its operations, and prepare for extending its usefulness in the future. The reasons for its existence are more apparent than they were three years ago. While all of us realized at that time, that electrical industries were in their infancy, the importance of scientific training was not appreciated as it should have been. It is now generally admitted that the best commercial results can be obtained in the electrical field by following out scientific theories, especially where they have been confirmed by practice.

If we have learned all there is to be extracted from the study and practice of electricity, the Institute has no mission. If, however, we are progressive, and desire to obtain further knowlege of the art as we perform our various duties in this growing field, then we should not only continue the good work we have undertaken but seek to extend the usefulness of the Institute by bringing to its support all who are in any manner interested in the various applications of electricity, and are desirous not only of profiting by the experience of others, but are willing to contribute their own ideas for the benefit of their fellow members.

As stated in my last annual report, there were upon the roll of the Institute a large proportion of names which had been placed there at the time of organization without proper authority. By instruction of the Council, circulars were forwarded to all of these requesting that they express their views as to accepting associate membership. Acting upon further instruction of the Council, the names of those who responded unfavorably, or who failed to reply to the request were stricken from the roll. Although this resulted in a loss of seventy names, it was apparent, rather than real, as the Institute had never received active support from them.

There still remains upon the roll, however, the usual percentage of delinquents, most of whom joined during the enthusiasm of organization, and, who having since lost interest in the welfare of the Institute, are practically of no benefit to it. The Institute having now apparently passed the critical period in its existence and attained a recognized scientific standing at home and abroad, far in advance of all other strictly electrical associations in the country, membership in it is correspondingly appreciated.

It is the only association, national in its character, which brings into the arena of discussion all branches of electrical research, and it may be added that in none of them are such subjects so thoroughly and intelligently treated, and so accurately recorded, and published for the information of absent members, as well as for future reference. To build up such an organization; to secure the active support of patient, zealous workers, until it attains full recognition, as a worthy public institution is a difficult undertaking; and that we have reached our third anniversary with bright prospects for the future is a very encouraging fact.

Two previous reports have directed your attention to the importance of holding more frequent meetings, in order to awaken and maintain interest in the welfare of the Institute, which it was feared might lose ground, unless opportunities were offered for occasional gatherings during the year. Acting upon these suggestions, four meetings have been held since the 18th of May, 1886. The proceedings of these meetings were very fully reported in the electrical journals, and were also copied in foreign electrical periodicals. They have been beneficial to the Institute in various ways, and it is to be hoped that our members will contribute during the coming year a sufficient number of papers to enable us to hold at least eight similar meetings.

Nothing whatever has been accomplished toward securing permanent quarters, and this is perhaps the most serious obstacle which remains to be overcome. The continued courtesy of the American Society of Civil Engineers in granting us the use of their rooms for our Council and general meetings, while most heartily appreciated, does not satisfy the natural desire for a home of our own, and until this end is attained, it is hardly possible that the full benefit of organization can be realized. The receipts of the year were $1,082.80, being $107.55 in excess of the previous year, while the expenses have been about $200 less, leaving an apparent balance in the treasury of about $400, after all obligations are paid. As our receipts are now greater than our expenses, this surplus ought not to be reduced. The present condition of our affairs is such that I believe a much better showing may be made during the coming year, and I see no reason why we should not move forward with confidence toward attaining that most desirable achievement in the history of any similar society—a permanent record of scientific papers and discussions

of which every member should be proud, based as it is upon the intelligent researches of its supporters.

Respectfully submitted,

RALPH W. POPE,
Secretary.

NEW YORK, May 17th, 1887.

RECEIPTS DURING THE YEAR IN DETAIL.

[Entrance Fees in Brackets.]

MAY, 1886.			
17	L. C. Baker		$10.00
17	Moses G. Farmer		10.00
19	E. P. Roberts		10.00
19	J. S. Ross		10.00
20	Geo. C. Maynard		10.00
20	Wm. Wallace		10.00
JUNE.			
8	W. M. Callender		10.00
9	P. B. Delany		10.00
9	M. M. Davis		10.00
16	G. A. Hamilton		10.00
16	W. J. Johnston		10.00
16	D. H. Bates		10.00
16	E. J. Houston		10.00
16	Leo Daft		10.00
17	S. M. Plush		10.00
17	E. H. Goff		20.00
17	C. B. Whiting		10.00
18	H. L. Roosevelt		10.00
18	Chas. R. Cross		10.00
19	T. C. Martin		10.00
19	C. J. Glidden		10.00
19	W. H. Forbes		10.00
21	J. F. Morrison		10.00
21	S. D. Field		20.00
21	J. A. Miller		10.00
21	W. A. Anthony		10.00
22	E. N. Dickerson, Jr.		10.00
24	M. G. Farmer		10.00
24	R. K. Dana		10.00
24	C. F. Brackett		10.00
24	T. D. Lockwood		10.00
24	E. H. Brooks		10.00
29	G. F. Durant		10.00
29	F. W. Jones		10.00
29	J. M. Mitchell		10.00
29	J. P. Davis		10.00
29	F. P. Mills		10.00
30	G. W. Stockly		10.00
JULY.			
1	C. F. Brush		$20.00
9	C. C. Hall		10.00
12	E. P. Thompson		10.00
13	F. L. Pope	[$5.00]	35.00
17	W. B. Vansize		10.00
17	H. C. Adams		10.00
17	E. G. Bernard		10.00
19	E. Weston		10.00
20	F. A. Mason		10.00
20	W. D. Sargent		10.00
20	C. L. Bruns		10.00
23	E. F. Phillips	[$5.]	14.16
27	J. E. Smith		20.00
28	C. W. Raymond	[$5]	15.00
AUG.			
5	R. S. Waring		10.00
13	G. W. Mansfield		10.00
13	G. M. Phelps, Jr.		10.00
13	Jesse M. Smith		10.00
SEP.			
4	C. Williams, Jr.		10.00
16	S. F. Shelbourne		10.00
28	C. E. Chinnock		10.00
OCT.			
1	C. F. Chandler		10.00
14	Ph. Diehl		10.00
18	H. I. Iselin		10.00
NOV.			
24	F. Van Vleck	[$5.]	10.56
DEC.			
6	M. B. Leonard	[$5]	10.56
7	S. S. Wheeler		10.00
13	A. R. Ledoux.	[$5]	10.00
13	Sam'l Insull		10.00
JAN., 1887.			
1	R. W. Pope	[$5.]	25.00
MAR.			
9	H. C. White		10.00
10	C. L. Clarke		10.00
11	W. P. Trowbridge		10.00

Mar.		
14	C. A. Doremus...	10.00
14	Wm. Wallace	10.00
14	H. C. Roome....	10.00
14	W. B. Cleveland..	10.00
15	Adam Bosch.....	10.00
18	R. Hewitt, Jr.....	10.00
18	T. A. Edison.....	10.00
19	Theo. N. Vail....	10.00
24	Dr. Norvin Green.	10.00
25	L. C. Baker.....	10.00
28	C. O. Mailloux....	10.00
April.		
1	C. A. Cheever....	20.00
2	O. E. Michaelis...	10.00
6	C. B. Hotchkiss [$5]	6.67
14	C. A. Terry.. [$5.]	6.67
	Alex Graham Bell.	10.00
	Hartley Gisborne..	10.85
16	T. H. Delano.....	10.00
19	Henry Metzger...	10.00
22	A. C. Fowler [$5.]	13.33
22	W. S. Turner.....	10.00
24	E. P. Roberts.....	10.00
29	Jos. Wetzler.....	10.00
29	F. W. Royce.....	10.00
May.		
11	J. P. Abernethy..	10.00
12	T. C. Martin.....	10.00
13	D. C. Jackson [$5.]	15.00
	Total.....	$1,082.80

Secretary's Balance Sheet.

May 16, 1887.

R. W. Pope, Secretary, in Account with the A. I. of E. E.

Dr.		*Cr.*	
1887.		1887.	
Balance from 1886.....	$ .91	Cash to Treasurer	$863.97
Dues from Members, as per list, including $55 Entrance Fees.	1,082.80	Messenger	.32
		Postage	33.63
		Dinners, guests and deficiencies	5.00
		Stationery	4.10
		Blackboard..	3.00
		Cartage.....	.75
		Stenographer, (2 meetings).	20.00
		Copyright	1.02
		Balance on hand	151.92
	$1,083.71		$1,083.71

E. & O. E.

Note.—Other expenses of the year having been paid by the Treasurer, do not appear in the above statement.

MR. T. C. MARTIN:—I move that the list of members who have paid their dues which is appended to the Secretary's report be taken as read.

The motion was carried.

MR. MARTIN:—I have a list of members in my hand. I think it would be well before we proceed to the election of officers to have the names of all the members in good standing read.

THE PRESIDENT:—If you will wait a moment, Mr. Martin, we will see what action is taken on the Secretary's report.

CAPTAIN MICHAELIS:—I move that the report be accepted and printed in the transactions.

The motion is carried.

THE PRESIDENT:—The Treasurer has failed to file any report in time for action by the meeting and we shall have to depend for knowledge of the state of our finances on information that the Secretary has kindly collected for us.

The Secretary then read the list of members.

THE SECRETARY:—I might say, in regard to this list, that I wished to avail myself of the opportunity to send it out with the invitations to the collation this afternoon, and in order to do that, I had no time to compare it with the records and check it off, and I find that I omitted one or two names—the name of E. P. Thompson, and that of William Lee Church, a recent member, and we have added to-night the following new associate members: W. Dwight Wiman, Francis R. Upton, C. L. Edgar, Clarence E. Stump, J. O. Ellinger, Alexander P. Wright, Otto A. Moses, Lieut. E. Zalinski, United States Army, I. L. Roberts, and Lieut. W. D. Weaver, United States Navy—ten in all.

THE PRESIDENT:—The list of members shows a healthy and continuous growth. I think we may congratulate ourselves on the interest that is being taken by the electricians of the country in the prosperity of the Institute, which is evinced in the best possible manner by sending their names in as candidates for membership, and we may congratulate ourselves also on the quality of the new accessions as well as upon their number. We are now ready, I believe, to proceed to the election of officers, and Captain Michaelis will read the nominations.

CAPTAIN MICHAELIS:—The committee appointed to make nominations have availed themselves of information received from members. There has been considerable discussion of the subject of filling vacancies during the past month—ever since the

last Council meeting, and their prompt action is due to the fact that they were well informed in regard to the wishes of the members, and in suggesting names they have not strictly followed the idea which is the basis of our constitution with regard to geographical distribution, but they felt that during the early years of the society, it would be well to have in the Council, men who would attend its meetings and be active in forwarding the interests of the Institute. In regard to one nomination, in which the feeling was unanimous, they are sorry to have to report that they could not meet the unanimous wishes of the members they have come in contact with during the past month, and that is in regard to the office of President. It has undoubtedly been the wish of every member of this society, that our present distinguished President, would be willing to accept another term; but he has positively declined, nothwithstanding all influences that were brought to bear upon him. He will not accept the office again and his reasons are, namely: what he considers the best interest of the society. In the first place, he desires to establish the precedent that there should be rotation in office and that one term is sufficient, but I am glad to say that he has consented to permit his name to be used as a candidate for vice-president. The committee has therefore nominated for the office of President, a gentleman than whom there is no other one, who has shown more interest in our progress, or who has done more for us; we nominate for the office of President, Mr. T. C. Martin; for Vice-presidents, to fill the full term of two years, Mr. F. L. Pope, Col. R. R. Hazard and Prof. W. A. Anthony, and to fill the vacancy for one year, made by the resignation of Mr. Lockwood, Prof. Elihu Thomson; for Secretary it is needless to state the committee's nominee—our present incumbent, whose able report we have just listened to with great pleasure, Mr. R. W. Pope; for Treasurer, the committee has transferred one of the Managers of the Institute, as the present Treasurer has been promoted to be Vice-president; we nominate (two of the committee do at least,) to that office, Mr. George M. Phelps, Jr.; for Managers, Messrs. Schuyler S. Wheeler, Joseph Wetzler, A. C. Fowler and William Lee Church, and for the unexpired term created by the transfer of Mr. Phelps to the treasurership, Mr. Edward P. Thompson.

THE PRESIDENT:—You have heard the nominations brought in by the committee. Any further nominations are now in order.

A MEMBER:—I move that the nominations be closed.

The motion was carried.

THE PRESIDENT:—We are now ready to proceed to the election.

MR. PHELPS:—I do not know whether it is necessary to make a motion, but if it is, I would move that two tellers or scrutineers be appointed.

CAPTAIN MICHAELIS:—The Constitution provides for that.

MR. WETZLER:—I think as there is only one set of nominations the matter might be expedited by requesting the Secretary to cast the vote of the Institute. I make the motion that the Secretary cast the vote of the Institute.

MR. MAILLOUX:—I second the motion.

THE SECRETARY:—It requires unanimous consent to do that.

MR. PHELPS:—Would not the proper procedure be for the Secretary to cast a separate vote for each name? Would it be proper to lump the whole Council and everything together?

THE SECRETARY:—It appears to me it is a matter of precedent. So far as I am concerned, I would like to see the ballots taken separately for the vice-presidents in a lump, and the managers in a lump, or else for each one individually. If there is no objection made, we can go on and elect them all in a lump by ballot, I suppose.

MR. WHEELER:—It seems to me as if that might bring up some question about the legality of the election, but to expedite that, how would it do to pass the sheet around and have each one of us declare that it is his ballot?

CAPTAIN MICHAELIS:—I find that the committee on nominations has made a mistake in regard to two officers. The Constitution declares that vacancies shall be filled by the Council, so that the committee will have to withdraw the nomination of Prof. Thomson for Vice-President, and for Manager, Mr. Edward P. Thompson.

THE PRESIDENT:—That can be done without any action on the part of the meeting.

CAPTAIN MICHAELIS:—I second Mr. Wetzler's motion, Mr. President, that the Secretary cast the ballot for the members. Did I understand Mr. Wetzler that he wished to cast his ballot for the whole ticket?

MR. WETZLER:—Yes, sir.

The motion was carried.

THE PRESIDENT:—There can be no question as to the legality of it, if no one objects.

THE SECRETARY:—Do I understand now that the meeting is not competent to fill these vacancies and that the nominations to fill them shall be stricken out?

THE PRESIDENT:—Yes, and that they should be withdrawn and filled by the Council. I will appoint as tellers to receive this ballot, Mr. Wheeler and Mr. Shelbourne.

The Secretary deposited the ballot with Mr. Shelbourne, as teller, who thereupon announced the names of the persons elected.

THE PRESIDENT:—Gentlemen, you have heard the names of candidates selected, as announced, and I hereby declare them elected.

We are now ready, I suppose, for any other business.

MR. MAILLOUX:—I think it would be well that the names of the officers still holding office should appear in the list. If it is necessary, I would like to make a motion to that effect, that when the names of the officers are published, that the full list be included, so that members and others, and the public, shall know the entire list of officers of the Institute.

THE PRESIDENT:—I think the motion is hardly necessary, Mr. Mailloux, I will instruct the Secretary to have that done.

THE SECRETARY:—Would it not be well to have it understood that we will hold a meeting of the Council after the adjournment of this meeting to fill those vacancies and have the whole business completed?

MR. PHELPS:—I have a resolution to offer. We have all read in the able report of the Secretary the remarks which he has made in respect to our want of habitation, and the fact that we are still indebted to the kindness, but at the same time charity, of others, for a roof over our heads when we get together. It is not disagreeable to come to the house of the civil engineers—it is always a pleasure; but at the same time we would all be happier and the society would be more useful, if we had our own roof; and the desire for that is very general, and some of us are of the opinion that we are better able to accomplish something in that line than we have thought we were. If we would really put our hands to it and undertake it seriously, and with the view of having it done at once, I would offer a resolution, in the hope that it will bring out an expression of opinion and a favorable vote:

Resolved, That in view of the general interest evinced for three years past by members in proposals for some permanent quarters for the Institute, that a committee be appointed at this meeting

to report at the meeting to-morrow on the best plan to be adopted and the sum necessary for the purpose named.

The resolution was seconded.

MR. SHELBOURNE:—I should like to say that, as I understand it a committee has been appointed and now exists, as just suggested to me, and as my memory serves, for that very purpose—a committee on permanent quarters. I think that committee was appointed more than a year ago, if not two years ago.

MR. MARTIN:—Three years ago.

MR. SHELBOURNE:—Yes; and I should like to know what that committee has been doing all this time, and who composed it.

MR. MARTIN:—I was present at the last meeting of the Council, Mr. President, and the committee in question had no report to make, and as I understand it, this is not any usurpation of the functions of that committee. It is appointing a new committee to start in afresh and to make a record, which the other did not do. I am not aware that the other committee has any *status.*

CAPTAIN MICHAELIS:—Discharge the other committee.

MR. MARTIN:—It expires, sir.

MR. SHELBOURNE:—The point is quite pertinent, but in general I understand that that committee holds on from this day forth.

MR. PHELPS:—In point of fact that question has been out of the hands of the committee more than a year.

CAPTAIN MICHAELIS:—Put in the word "new;" that will settle it.

THE PRESIDENT:—With your permission, Mr. Phelps, I will make the change.

MR. SHELBOURNE:—I do not like to see things duplicated. It is proper that when a committee is appointed for any purpose, before any other committee is appointed for the same purpose that that committee should make a report, or decline, or become *functus officio* in some way. If the committee has not made a report, or has not declared what it was going to do, or considers itself as having reported or discharged, or defunct, why then of course, Mr. Martin's motion would be proper, but only upon that statement.

MR. MARTIN:—That committee, if I am not mistaken, Mr. President, was a committee of the Council, not of this body, and the Council, as master of that proceeding, requires no further service from that committee. We are now asking for the appointment by the chair of a committee out of this body.

MR. SHELBOURNE:—Then my remarks fall.

THE PRESIDENT:—I think Mr. Martin is right, that it was a committee of the Council, and as it does not seem to have accomplished very much, there certainly can be no harm in a committee of the whole Institute trying to see what it can do.

MR. MARTIN:—I would like then to withdraw, if in order, that word "new." It is not a new committee of the Institute at large; it is a committee.

MR. PHELPS:—I think under that ruling, which seems to be quite right, if the old committee was a committee of the Council the resolution had better stand as it did in the first place.

MR. WETZLER:—I think we could separate that matter by making a motion to the effect that the old committee be discharged.

MR. MARTIN:—The record shows that it was a committee of the Council.

THE SECRETARY:—I might add that they have made sundry reports to the Council of different ideas of new buildings put up that we might occupy but there has been nothing definite done.

The resolution was adopted.

THE PRESIDENT:—I will appoint on that committee Mr. Phelps, Mr. Martin and Mr. Hamilton.

THE SECRETARY:—In conversation with Captain Michaelis this evening, it appeared to me that he has some ideas about this question of permanent quarters, which would be of value and he has had a good deal of experience in that direction, and while I do not know if it would be in order to add him to the committee, yet I should like the committee to receive the benefit of his experience in the matter.

THE PRESIDENT:—There is no number specified, and I will therefore add Captain Michaelis to the committee.

THE SECRETARY:—In view of the appointment of this committee on quarters, and also of the fact that the question has come up among sundry members of the Institute in regard to amalgamation, and the bringing in members of another class, and also providing for certain other points that are not covered by the rules, I think it would be well to appoint a committee for the revision of the by-laws to take into consideration those new points, and acting on our experience try to cover them as fully as possible. I believe it would be for the interests of the Institute if we could get a working committee by which something could be accomplished in the direction of extending the influence of the Institute.

MR. MAILLOUX:—I second that motion.

THE SECRETARY:—I made no motion.

THE PRESIDENT:—That seems to be an excellent suggestion.

MR. MARTIN:—Might we not have that formulated in some way?

THE PRESIDENT:—You might put it in the form of a resolution. The suggestion has been made by some of the members—I do not recollect whom—quite recently, that it might be well to establish a junior membership of the younger men who are entering the profession and who are enterprising and industrious workers, but who can hardly afford to pay the regular annual dues of the Institute, and that that membership should have certain restrictions imposed upon it. They should not be above a certain age, perhaps, and possibly there might be some other restrictions of a similar character; and I would suggest, if such a committee is appointed, it might be well to take that matter into consideration. It seems to me that we can in that way get quite a large membership of young men whose fellowship will be of some advantage to us, and a great deal of advantage to them, and it will certainly bring them all into full membership ultimately—every one of them that is worth having.

THE SECRETARY:—There was one other point I wished to cover, providing for monthly meetings. There appears to be no provision in the rules at present for regularly called meetings. They must be special meetings, and the general meetings are not provided for at any special date. It has also come to my notice that there is a field for the establishment of branches of the Institute in some of the large cities of the country, and if we succeed in making the home Institute what it should be, a great deal of good work may be accomplished throughout the country. The electrical interests in other cities are very large, and with a little assistance and advice perhaps, and by providing in the rules for the establishment of such branches, I think that some good may be accomplished in that direction, and I would offer the following resolution:

Resolved, That a committee of five be appointed by the Chair for the purpose of revising the rules to provide for extending the usefulness of the Institute.

That is all there is to it, but, of course, any members having any points to suggest, they can hand them in to the committee.

MR. PHELPS:—To report when?

THE SECRETARY:—At the next meeting.

MR. PHELPS:—To-morrow?

THE SECRETARY:—They could hardly revise the by-laws, but they might make a report covering the points that the rules should provide for.

MR. MAILLOUX:—I think that the whole question is one which might properly be left to the care of the Council. I do not see why the Council should not be authorized to look after this matter, and appoint a committee of its own members to do the work. The Council meets oftener and has better opportunities to canvass these questions and to determine what should be done. Consequently it seems to me that it is a matter coming within its special province, and if Mr. Phelps has no objection it might be put in that form by a motion.

THE PRESIDENT:—The Chair would suggest that it might be perhaps a proper way to get at it, for the meeting to authorize the Council to go on with this work at their discretion. I do not think that there is anything in the constitution or by-laws to prohibit that being done.

CAPTAIN MICHAELIS:—The constitution provides that the rules may be amended at any time by a two-thirds vote, provided a notice be given at the previous meeting, so that the object of having such a resolution as is offered by the Secretary is to give notice; that is all. I presume if this meeting passed a resolution directing the Council to adopt such amendments as they might deem proper, that that would be tantamount to giving them notice; and so it would be in order at any subsequent meeting for the Council to report, and submit the results of their thought and study to the Institute for ballot. I think, Mr. President, this is really a very important subject. We have once amended our constitution and devoted some time to it, and like everything else in the beginning, time shows that we have not done the work, so that it would meet all possible contingencies. We have had an example to-night. There is no provision in the constitution for nominating officers; and there were certain things that occured this evening that were not pleasant to hear. It is perhaps the most important function of a society to nominate proper officers, and that ought to be left to a committee of the society, and that committee ought to be elected by ballot, rather than appointed, so that it will represent the body of the society, rather than any section of it. The other points mentioned by the Secretary, I think are really very important—this junior class and a great many other things, and I cordially support the motion. It really

makes very little difference whether the Council be instructed to do it, or whether a committee be appointed by direct vote of the society.

THE PRESIDENT:—I think, perhaps the work could be done as satisfactorily and as quickly by the Council.

MR. WHEELER:—Is there any motion before the house?

THE PRESIDENT:—The resolution by the Secretary.

MR. MAILLOUX:—I should like to offer my remarks just made as an amendment to the resolution offered by Mr. Pope, the Secretary.

MR. PHELPS:—I would suggest that perhaps the simplest and easiest way to get it into shape, upon which I think we are all agreed now, would be simply to put this meeting on record as requesting the Council to take that subject up at an early date, embracing the points expressed in Mr. Pope's resolution, if Mr. Pope would accept that as an addition to his resolution, changing the form of it slightly. I think that would meet the case.

MR. WHEELER:—I suggest this amendment: that the Institute direct the Council to take such steps as they see fit, to increase the membership and the interest in the Institute and make it more popular, and to establish a class of junior membership to enable the Institute to comprehend a great many young men who would be valuable members who cannot be brought in under the regular membership.

MR. PHELPS:—I suppose, Mr. Chairman, that no final action upon any amendment, upon any new programme whatever, any change in our organic law, so to speak, can be made by the Council, even under the instruction of the Institute. The Council will have to report to the Institute.

THE PRESIDENT:—It will have to be sanctioned by the Institute.

MR. WHEELER:—The action is to be taken by the Institute, as I understand, but the thinking has got to be done by the Council. They have got to get out a good programme, and when that is presented to the Institute, it is generally carried through.

CAPTAIN MICHAELIS:—I think that this snarl could be unwound very easily, if the motion was made, that the Council be constituted a committee to take into consideration constitutional amendments, and that the passage of this resolution be deemed the proper constitutional notice; I think it will meet all the points. The Council of its own motion cannot submit amendments under

the constitution. You have got to present them at one meeting and act upon them at another, but you cannot constitute the Council a committee and deem this appointment of the Council proper notice of the amendment.

THE PRESIDENT:—It seems to me that meets the case very well.

MR. MARTIN:—Rule 2 provides for three classes of membership, and rule 8 provides that this rule can be amended at any regular meeting by a two-thirds vote of the members present, provided that notice be given, etc. That notice can be given to-night, and the Council should have it in its hands to regulate, classify, and mark the limitations of the new class; and also take in hand those other constitutional amendments.

CAPTAIN MICHAELIS:—It is well enough to try it, but I really think it is impracticable. I think that one of the gentlemen present will agree with me that when you get to amending the constitution the hours slip by.

MR. PHELPS:—If you will pardon me, Mr. President, I do not believe that there is any proper way to avoid one distinct provision—any change in the by-laws or constitution will have to be presented in full at one meeting and acted upon at another. Nothing can substitute that as a notice as far as I can see. The Council might set to work upon the subject, or be requested to go to work, and then report the result of its work at some time, and then at the next meeting after that it could be adopted, but the thing has got to be presented and in shape for consideration during the interval between one meeting and the other.

MR. THOMPSON:—I would make a motion—it may interfere with some other motion—that a committee of three be appointed for the distinct purpose of amending the by-laws. That would be a great deal of work. It needs the constant energy of two or three men who can assemble together and take such time as is needed; so I would make a motion that a committee of three be appointed to amend the by-laws.

THE PRESIDENT:—Mr. Thompson's motion is substantially the same as Mr. Pope's resolution, except that he proposes a committee of three instead of a committee of five. I believe that neither of the motions has yet been seconded.

MR. PHELPS:—If neither motion has been seconded it is open to make another one, and therefore I will simply move that the Council be directed to consider the subject of the revision of the by-laws, or constitution if necessary, with a view of adding a class

of junior members and a general view of increasing the scope and usefulness of the society.

The motion was carried.

CAPTAIN MICHAELIS:—I am requested to give notice of the following amendment to our constitution:

The Council shall have power to elect junior associates who shall have been engaged in electrical or cognate industries for one year. These junior associates shall not have the privilege of voting but shall be entitled to be present at meetings, take part in discussions and receive one copy of the proceedings. They shall be required to pay one-half the initiation fee and annual dues.

MR. WHEELER:—I offer the following amendment to the resolution just read:

That the title of this class be made juniors, and not junior associates, and that the dues be made five dollars a year with copy of the transactions, or three dollars without copy of the transactions, and half of the initiation fee of regular members.

The motion was seconded.

MR. PHELPS:—I suppose this is only a suggestion; we have nothing to vote upon to-night.

THE PRESIDENT:—I think you are right, Mr. Phelps.

CAPTAIN MICHAELIS:—I offered this amendment at the request of gentlemen. I think that there is a pressing need for such a resolution or amendment as this is. It is not intended to interfere with the motion heretofore passed in regard to the Council amending the constitution, but it is an important and pressing emergency. The only way we can get at that under the constitution is that when we adjourn to-night the Council shall call a special meeting, which shall have the right to act under the constitution, or that to-morrow be designated as one of the meetings under the constitution, or that fifteen members, or whatever the number is, join now in the call for a special meeting.

MR. MARTIN:—There is a meeting to-morrow of which notice has been given.

CAPTAIN MICHAELIS:—Is the meeting to-morrow a business meeting?

THE PRESIDENT:—To-morrow is a general meeting, but there is nothing to prevent business being done if you choose to do it.

CAPTAIN MICHAELIS:—The meeting to-morrow is one of the two meetings provided for in the constitution to be called by the Council.

THE PRESIDENT:—Yes, sir. Mr. Wheeler you may incorporate your amendment with Captain Michaelis's.

MR. WHEELER:—It is the same thing, Mr. President.

MR. PHELPS:—I would like to offer a further motion, to wit: That the Council be instructed and authorized to proceed to incorporate the Institute under the laws of the State of New York, appropriate to such a society, and with power to designate from their own number a Board of Trustees.

MR. MARTIN:—I second that motion. It is highly important that that step should be taken.

MR. PHELPS:—It is obvious, that in respect to the resolution that has been offered for a committee to report a scheme for permanent quarters, that should that resolution bear fruit, and should we take up that work in earnest, it is essential that we should be incorporated in order to take possession of any funds or property which we might acquire.

THE PRESIDENT:—There is no question about the necessity of it. You have heard the resolution made and seconded.

CAPTAIN MICHAELIS:—I think something ought to be added to that resolution. There are two laws under which we can be incorporated; the old law of 1848, and the Limited Liability Act. The law of 1848, is very simple; it provides for capital, etc., and the law passed within six months, provides a tax on capital. It is a very simple matter to incorporate the society. All you have to do is to file a certificate with the Secretary of State at Albany. But the question of capital will have to be decided on, also other details. Clubs have been organized and incorporated without capital, and I think it is perfectly feasible to do that and still hold title to real estate, and we would save the tax. But that is a matter I should think for the Institute to decide, whether they want to be a capitalized concern.

THE PRESIDENT:—There is no tax on religious organizations, is there?

CAPTAIN MICHAELIS:—If they have capital, there is. All capital is subject to one-eighth of one per cent.

MR. PHELPS:—The intent of my resolution was that we should incorporate as similar societies do. I supposed that such societies were seldom incorporated with capital. But if it should be necessary we might add to it, although I doubt whether it is. It will be necessary for the committee to look into the question and see that it is incorporated in a proper way.

THE PRESIDENT:—I should think it might be well to leave that to the discretion of the Council.

MR. SHELBOURNE:—I happen to know that societies for religious, literary and benevolent purposes, and the like, are not taxed upon their capital. They are taxed, however; corporations must pay a tax of one-eighth of one per cent. (that is what Captain Michaelis referred to), upon their proposed capital for the franchise of incorporation. That law is general and was passed as recently as April of last year, and provides for a tax of one-eighth of one per cent. upon the capital. Now, if a society for benevolent purposes can be incorporated upon a nominal capital, or a nominal number of shares, why, the tax would be very light indeed. But there is no tax under the law of 1880 as amended in 1881, 1883, and 1885. That provides for a tax upon the capital stock, franchises and business of certain corporations which are named.

THE PRESIDENT:—Does any one know if there is any objection to incorporating under the laws of some other state than under the laws of the state of New York? Our organization is a national one, although our property is here.

MR. SHELBOURNE:—The corporation laws of all the states differ in some respects peculiar to their own institutions, and the opinions of their own people, and that is a matter for a lawyer to hunt through the laws of the different states to determine; and lawyers in this state have sometimes passed days, and even weeks on that very question in advising whether it is better to incorporate under the laws of West Virginia, or the laws of Maine, or some other state.

THE SECRETARY:—It appears to me that this question can be very properly left to the Council with power. There are other institutions similar to ours that have been incorporated; and I presume that their experience can be very properly followed by us.

THE PRESIDENT:—As the question stands now seconded, it will leave the matter to the Council, and I call for a vote on that proposition.

The motion was carried.

MR. WHEELER:—I give notice that at the next meeting I will offer the following amendment to the constitution:

"The Council shall have power to elect juniors who have been engaged in electrical or cognate interests for one year or more.

These juniors shall not have the privilege of voting, but shall be entitled to be present at the meetings and take part in the discussions. They shall be required to pay one-half the initiation fee and five dollars annually, with one copy of the transactions, or three dollars annually, without."

THE SECRETARY:—This I suppose is a notice of a proposed amendment to the Rules. It is not exactly in accordance with the rules as they stand; for instance, the present initiation fee is five dollars; half that would be two dollars and a half, and half the annual dues would be five dollars. Is it the intention of the resolution to require them to pay half the initiation fee—two dollars and a half, and half the annual dues—five dollars, including the transactions, and three dollars without the transactions?

MR. WHEELER:—That is the idea.

THE SECRETARY:—It seems to me that it would be better to take it in hand and make the matter right, so that there will be no misunderstanding about it. It is sufficient for you to give notice that you propose some amendment, and then put it in such shape that it will accord with the rules as they now stand.

MR. WHEELER:—That can be done to-morrow, can it not? I simply offer that as a notice.

CAPTAIN MICHAELIS:—If we were to get a house it is very evident that the dues would have to be raised. It is impossible to run a club-house in the city of New York, with twenty-five cents a month per member, or even at fifty cents, which would make six dollars a year. At the present rate it would not begin to pay the rent or the interest on the debt, or anything else. The chances are that if we get a club-house and a place to meet, and have it open, the dues of resident members may have to be increased. You cannot have a club-house in the city of New York and charge members less than a dollar a month for its privileges. That is out of the question.

THE PRESIDENT:—There are two things to be considered in that matter. It seems to me one is; there is a large number of these young men who, if we do not take in at the reduced price, will not come in at all. And another matter is that I think it would be well to have some limit of age, or some limit of time; otherwise you might have men coming in as juniors and staying as juniors until they were seventy years old.

MR. WHEELER:—I will suggest that it is not the age that will always determine whether a man is qualified to become a junior

or not. It would be better to limit his time as a junior to a certain number of years after he has been admitted as a junior.

THE PRESIDENT:—I should think five years would be as much as would be necessary.

MR. PHELPS:—That would be an ample limit, because if a man—young or old—comes in as a junior and can pay three dollars a year, if after working five years longer at electricity he could not then earn enough to pay us our full fee, he cannot be much of a member.

THE PRESIDENT:—I think you are right, Mr. Phelps, and perhaps, on second thought, three years would be as long as is advisable.

MR. SHELBOURNE:—I have not heard of this proposition before this evening. The feeling with which it strikes me is decidedly adverse. I think that if this Institute takes that step it will be a most evil and fatal one. We are to lower the dignity and importance and character of this society by proposing to admit some young men, say they are up to eighteen years of age. How many of these young men do we propose to get? And if we let down this society and cast a big drag net and bring in everybody and let the little fish come in for so much, and the big fish for so much, the question is whether the big fish will not feel that their importance is lowered a great deal by the presence of the small fish. And what will these young men expect to gain here for their money? This is not a school; it is not a laboratory; there are no instructors. They simply come in here perhaps to hear older men talk. Will they pay their money for that purpose? Will they pay their three dollars a year to come in and sit at these meetings, or the annual meeting, or at the dinners which the society will perhaps give two or three times during the winter, and pay their dollar for the dinner? I say no. I say that the gain that this Institute would derive from such a purpose as that will be more than offset by the loss which the Institute will suffer among such men as occupy the higher walks of science such as Professor Thomson, and Professor Anthony, and those people who are at the head of the electrical and scientific world. We have now an associate membership, which provides for any number of just such young men, if they went to come here. The only question is about their paying the ten dollars instead of the five. I had something to do with preparing the amendments to the constitution and by-laws of this society; and I know we had a long

discussion there as to how we could accomplish just what this amendment seems designed to accomplish. There was a clause put in as to the qualifications of associate members, those who by study or experiment are seeking to become identified with electrical science or with the utilization of electricity. Now, I say, that will include all of these young men that you can get into the society. If you go to work and make an age qualification, you want an age qualification all through. If the membership of this Institute, which now comprises a hundred and seventy-five members and associate members and honorary members—if this society should create an interest and feeling among those men and bring them here to these meetings, we would have quite society enough, and we should have enthusiasm and interest enough. Now, instead of making Professor Anthony, or Professor Thomson, or any other professor, or scientist, feel that the society has lowered itself and is gathering in these boys with enthusiasm in their hearts for everything else, except what their seniors may say here; we wish to keep it where it is, and try to create an interest, and try to create a greater interest and even enthusiasm among those who are not among the class of those who might be brought in.

Mr. Martin:—I must say that Mr. Shelbourne's remarks are extremely weighty; but I will just mention one case which came to my notice to-day, of a young gentleman, thoroughly versed in the science of electricity, who, to make his first step, takes a position at ten dollars a week. He wants to come into this society. How can that man pay our dues?

Mr. Shelbourne:—That is a consideration for us to address to such an institution as the Cooper Institute. This is not an educational institution. If we had a course of study and a professor that was eminent to teach them something, than that would be a question of benevolence, and how much benevolence we could afford upon these young men. But this I say is a question as to the dignity and standing of this Institute; and if there are such young men, how many such young men could you get? Would you get twenty-five young men to come in here, if you had your fees ever so low? And if you did get those twenty-five, would'nt you alienate feelings of fifty men of standing, who feel that this society has no footing to stand on? Perhaps later on, this Institute will be on a par with the Royal Institution in England. I see by the report of the Secretary, that we are now rich to the extent of some four hundred dollars to go into the next year. Let us con-

sider that as a sufficient good beginning for this year and try to make even a greater surplus for the next year.

MR. MARTIN:—What we want to do, Mr. President, is to make this Institute useful. It seems to me that action of this kind must have been taken by similar scientific bodies at some stage or other of their existence; and I must admit that Mr. Shelbourne's remarks have impressed me very much. When this comes up to-morrow, it may be determined that it would be well to move slowly. I know that some of the older societies have this junior membership, but so far from regarding it as anything detrimental, their view of it is that it serves as a reservoir and feeder to the classes which are above, and it is one of the proudest events in the lives of those young men when their skill and experience enable them to pass from the lower stage to the higher.

THE PRESIDENT:—I think that our friend Mr. Shelbourne is somewhat disposed to underrate the character of the young men whom we have in view. We are thinking of the class of young men who are just graduating from the technical schools most of whom are under age, many of whom are now filling positions where their pay is very small, and yet men who in a very few years will be, as we know some of them have become in five years, at the top of the profession. I do not think that we are in any special danger of getting in the undesirable element that seems to be feared. There is only a certain class of young men who take the slightest interest in proceedings of this kind, and the others would not come near us if we paid them half a dollar for every meeting they attend. But in my own experience I have known a great many young men in a similar situation to the one Mr. Martin referred to, who would be very glad to come here and listen to the discussions and ask questions, and to learn what they could. We are certainly nothing more nor less than an educational society. We are endeavoring to educate each other by comparing experiences. Certainly a young man of any age, or an old man, who takes any interest in the subject, cannot possibly attend any of our meetings without learning something of value to him. If he is not interested in the proceedings he will not come and will not trouble us. That is my feeling about it. At the same time I think very careful consideration ought to be given to all that Mr. Shelbourne has said. There is a great deal of force in many of his remarks. I think we ought to go slowly and be very careful.

MR. SHELBOURNE:—I have no disrespect for the class of young men that the President refers to, or that Mr. Martin refers to. But these young men are, it seems to me, not numerous enough to benefit this Institute, and the Institute is not in a position at the present time to benefit them. Our meetings outside of those during which we have had dinners where special papers have been read, and special discussion upon those papers, have been entirely confined to the annual meetings, the business meeting of this evening, and the general meeting. And I do not see enough interest that we can offer to these young men, however little they are able to pay, which would induce them to come here except upon the expectation of being members by-and-bye. Now, if they have graduated from some technical college and are going out into business, if they are smart enough men, they will very soon grow into a position either in the electrical world or in some other branch of the scientific world, where they will be able in a few years to come in as associate members under the by-laws. Therefore, it is not because I have a disrespect to that class of young men, I respect them very highly; but I am considering what good we can do to them, and what good we can get, and what motive they can have to come in with us.

CAPTAIN MICHAELIS:—I have listened with much interest to what Mr. Shelbourne has said, and I must confess that I agree with him from beginning to end. It seems to me that he has not considered the point of this amendment. At our meeting in December, 1885, this question was discussed for hours, and finally after this prolonged discussion the following was adopted as a definition of associate members:—"Associate members shall be such persons as are, or have been, connected with the utilization of electricity, or who, by means of study or experimental investigation, are qualifying themselves to become identified with electrical science, and such others to whose admission no objection can be made by any member of the Council." Now, if anybody can draw up a broader clause to cover the admission of anybody I would like to see him do it. There is no age qualification. We can take in a boy of ten or a man of eighty. The point of this amendment is simply and solely a pecuniary one. It does not matter whether they add dignity to the society or distract from its dignity. We are told that there is a large body of men who cannot afford to pay our five dollars initiation fee or dues of ten dollars a year. Therefore, some of the members who have given

thought to the subject, propose to let them in for two dollars and a half, or five dollars, as they may decide. The question is, do we want to do that? It is simply a question of dollars and cents, and nothing else, because, under the present constitution the Council is perfectly competent to elect these men as associates. I think we ought to decide whether we want to reduce our dues. In some societies it is the practice to give the Council authority to remit a portion of the dues in deserving cases; but it is a simple question of payment and nothing else. There is no dignity involved or loss of dignity.

MR. PHELPS:—Except that the proposed class shall not be voters.

CAPTAIN MICHAELIS:—Except that the proposed class shall not be voters.

MR. WHEELER:—If the object was to be attained by empowering the Council to remit a portion of a person's dues, that person would feel it very much more than if he paid the dues of some regular class. I am very much impressed by Mr. Shelbourne's remarks as to the delicacy of making any amendment to the constitution, and venturing on any matter of this kind; but I think there are some other considerations which have been spoken of—the dampening effect of having young men here has been spoken of. But most men who are prominent in electricity are very anxious to have young men educated, and it is for the interest of most of the business men who have made money in electricity to have young men educated; they have suffered from the inability to find young men who understand the subject. Mr. Edison, I know, offered from twenty-five thousand to fifty thousand dollars worth of apparatus to any college which would establish a school of electricity. The men alluded to as likely to be driven out by the presence of young men, are just the ones who are anxious to have a class of young men grow up and learn these points; and I think that instead of driving those old men away, it would make them willing to come here and talk for the sake of giving the young men a chance to hear them. I know of a number who spend a good deal of their time in conversation with their assistants, explaining things to them, and sometimes repeating to them points that had been brought out at some of the electrical meetings. In a small way, I have done it myself with men in the employ of our company. I have spent hours at different times telling them things that had been brought out, because I thought

that instead of being time lost it would be time gained, if I could bring them to an understanding of a part of what other people knew. They would simply do that part of the thinking for me hereafter. I have been very much impressed by the remarks made on the danger of lowering the grade. But the same class of young men is introduced in some of the other societies. In the society, in whose rooms we meet to-night, they have a class of junior members which is very valuable. I am a junior member of this Society of Civil Engineers, because I cannot qualify as a full member. A full member is required to have spent seven years in actual engineering work, not as a man to carry out work, but as a man who can design the whole thing and do it. A junior member is one who has been in that class of work for two years. He has got to be one of the head men of the enterprise he is in. Now, there are a great many men who are valuable to have on hand, who have not been doing such work for several years. They are going to have a meeting to-morrow night, at which will be read a scientific paper on the Strains of Bridges. It is to be read by a junior member. Now of course we cannot have as high grade as that in our junior membership, but we may be able to gradually secure it. The Society of Civil Engineers, has also a class of associate members, similiar to our class of associate members. They are people who are interested in scientific work, but who are not engineers; for instance, chemists, and scientists of that kind. Now, if we can have a class of junior members so as to take in men who have not had quite so much experience as is required by our regular membership, without lowering our grade, it would be a very good thing to do, and I hope that in so doing we will have the benefit of the advice of some of those who have spoken to-night, because I have been very much impressed with many things said since I offered my notice.

Captain Michaelis:—Much has been said about the American Society of Civil Engineers, and I want to say that that was considered in December, 1885, and that clause was so worded as to include all the juniors of the American Society of Civil Engineers. To prove that it is a matter of dues and nothing else, I want to say that I have been thirteen years a member of the Society of Civil Engineers. The non-resident members are entitled to all privileges of membership; their annual dues are somewhat less, because they have less privileges of the club-house generally. Now, my dues as a non-resident member are fifteen

dollars, and I would like Mr. Wheeler to tell me what his annual dues are in the American Society of Civil Engineers.

MR. WHEELER:—Exactly the same.

MR. SHELBOURNE:—Then it appears that the arguments advanced by Captain Michaelis and Mr. Wheeler, do not agree. Captain Michaelis says, that this amendment is simply a matter of getting money, and if we put that out as a confession before the scientific world, and before the world generally, and before the newspaper press, I say that that very confession is a lowering of our dignity, that shows that we want money. If we want a building that we can say is our own; if we are going to be a society that will ever be on a par with the Royal Society of England, why I say, we want to keep up the dignity of this American Institute of Electrical Engineers. I say we do not want to confess that we want money. We do not want to confess that we want to get in a few young men, because we want money. I say let us avoid that position. If we want money, let us go to Jay Gould and get five thousand dollars from him; let us go to Dr. Norvin Green, and get three thousand dollars from him; let us go to some other men who have gained hundreds and thousands in electrical business and get five hundred dollars from them, and let us be an Institute of Electrical Engineers, with a reputation as wide as this broad continent, and let us produce our publications and papers, that will be on a par in science with those that are produced over in England; but don't let us confess that we are going out into the world to gather a few young men to get their three dollars a year.

THE PRESIDENT:—I don't think any of the proposers of this plan of junior membership did it with the idea of raising additional revenue.

MR. PHELPS:—I was going to say to myself that I thought Mr. Shelbourne, had rather inverted the meaning of Captain Michaelis. If I understood Captain Michaelis, he looked at the pecuniary matter from two different points of view. The principal one was that we probably could not afford to give the privileges we contemplate giving for three dollars a year. That is, I think, an important consideration. We may take such action in respect to privileges which could only be afforded for three dollars on eleemosynary considerations. Therefore, I think there is a good deal to be thought about in respect to this whole measure, and I think as the measure stands now that one modification, (if we carry it

out at all,) might very properly be made, striking out that three dollar clause. If a young fellow cares enough about the thing to join it he ought to care enough about it to want the proceedings. I should be rather in favor of striking that out and making a man pay his five dollars. He need not take the proceedings away if he does not want to; but let him have them.

MR. SHELBOURNE:—If, after what I have said, these gentlemen choose to resolve themselves into a committee to go ahead and do this thing, I say let them. I have delivered myself of what I have to say. I have said it fearlessly, plainly, honestly, and now I have done with it.

THE SECRETARY:—The discussion that has come up on this question has taken a turn which shows that it is a matter of importance, and should not be acted upon hastily, and furthermore that the two or three propositions that we have on hand depend on each other. If we get a building here we may not be able to do this thing, and we may offer such privileges that no man would think them dear at ten dollars a year, therefore I believe it should stand until we have proceeded a little further, and we find out what we are going to do, and that it be acted upon leisurely, and that all these arguments be taken into consideration. It appears to me that would be the most satisfactory way of doing it, instead of rushing it through without a consideration of all the facts that may come up hereafter.

MR. PHELPS:—I believe, Mr. Chairman, that I am right in recollecting that the resolution I offered early in the evening was passed?

THE PRESIDENT:—Yes.

MR. PHELPS:—Then it will rest, I suppose, with the mover to bring the matter up to-morrow if he sees fit, or it may be left to the Council to-morrow.

THE SECRETARY:—It appears to me that the Council has a good deal of time that it could devote to this subject, and in such a way that it would not interfere with our proceedings here to-day or to-morrow, and I believe that they could act upon it intelligently and consider all these questions. And if it is not absolutely necessary to put it through at once, I believe that that would be the best disposition to make of it. The Council sometimes is rather pressed for want of subjects for discussion, and I think this would be equally as good as the wire gauge.

MR. MARTIN:—I think it is quite possible, as I have already

suggested, that we will find in the rules of the societies in Europe, such as the one to which Mr. Shelbourne referred, something relating to this subject that we are now considering.

THE PRESIDENT:—I would say that the Society of Telegraph Engineers and Electricians, of which I have been a member almost from the beginning, has a class of membership of that kind. I do not recollect precisely what the regulations are, but of course that can be considered with other matters that will come up for discussion. That class was established after the society had been in operation some five or six years, and evidently was intended to supply a need which had manifested itself.

CAPTAIN MICHAELIS:—At the request of several members I desire to offer the following resolution:

The Institute desires to place upon record its appreciation of the services rendered by its retiring President, Mr. F. L. Pope, and its regret that he has deemed it for the best interests of the Institute to decline a unanimous tender of re-election.

The resolution was adopted.

THE PRESIDENT:—I thank you very much, gentlemen, for your kind appreciation of my services. They have by no means been what I would like to have made them. But circumstances have prevented my being in attendance at a great many of the meetings. I have always endeavored to be on hand when I could. I am sure that you will find that you have not made an unprofitable exchange in the worthy successor whom you have elected in my place, and I feel sure that we shall be pulling together, and make Mr. Martin's administration the most successful and prosperous one that the Institute has yet seen.

The meeting then adjourned.

At a meeting of the Council immediately after the adjournment of the annual meeting, Professor Elihu Thomson, was elected a vice-president to fill the unexpired term of Thomas D. Lockwood, resigned, and Mr. Edward P. Thompson was elected manager to fill the unexpired term of Mr. George M. Phelps, Jr., elected Treasurer.

GENERAL MEETING.

May 18th, 1887.

At the opening of the afternoon session of the general meeting, which was called to order by President Martin, at 2 P. M., the

Secretary read the following list of officers elected at the annual meeting: President, T. C. Martin; Vice-Presidents, Professor W. A. Anthony, Frank L. Pope, Col. Rowland R. Hazard; Managers, Schuyler S. Wheeler, Joseph Wetzler, A. C. Fowler, William Lee Church; Treasurer, George M. Phelps, Jr.; Secretary, Ralph W. Pope. Also the following gentlemen to fill out unexpired terms: Vice-President, Professor Elihu Thomson, and Manager, Edward P. Thompson.

THE PRESIDENT:—The first matter on the regular order of business is the very interesting paper and address that will be contributed by Professor Elihu Thomson, but before we reach that, I understand that a very important report will be presented, and we will take that up first. Mr. Phelps, as chairman of the committee appointed last night to report at this meeting, will now present his report from the Committee on Permanent Quarters.

MR. PHELPS read the following

REPORT OF THE COMMITTEE ON PERMANENT QUARTERS.

To the American Institute of Electrical Engineers:

GENTLEMEN:—Your Committee appointed to consider and report upon a plan for securing permanent quarters and to estimate the cost of same, offer the following report:

It should be stated first that the subject before the Committee has been discussed at considerable length during the past week by several officers and members of the Institute active in its work; and then the Committee avails itself of much of the suggestion thus brought out, as well as of information elicited by preliminary inquiries on the part of several members as to cost, ways and means.

As a result of inquiry, and consideration of the needs and possible resources of the Institute, your Committee recommend that immediate steps be taken towards securing permanent quarters; and it is their judgment that, in view of considerations presented below, the Institute will be justified in moving to purchase a house in this city, in an eligible location, and of sufficient capacity to provide all accommodations that will be required for many years. A dwelling-house, in a respectable neighborhood, not remote from Union or Madison Square, somewhat similar to that in which we now assemble, through the kind courtesy of the Society of Civil Engineers, could be easily adapted to our purposes.

The Committee have made inquiries as to the cost of such a house, and have been assured that a dwelling-house, 24 or 25 feet wide, and of three or four stories, can be purchased for $30,000 or less. Three such houses were found upon the list of a single prominent real-estate firm.

How shall sufficient money be raised to purchase and maintain such a house?

The Committee recommend that a fund of not less than $10,000 be raised by subscription. They have reason to believe that from $3,000 to $5,000 can be obtained from subscriptions of members of the Institute, and that the balance of the $10,000 proposed can, by proper effort, be secured by subscriptions on the part of gentlemen whose fortunes and business have been connected with the development of electric arts.

It is recommended that all subscriptions be made contingent upon the raising of the sum named, viz., $10,000.

With such a sum in hand, it is the opinion of the Committee, that the Institute would be justified in selecting and purchasing a house. The remainder of the purchase money could be raised on bond or bonds and mortgage, at a low rate of interest, probably not greater than 4 per cent.

In respect to the maintenance of a house, it is quite obvious that a large increase will be required in the present revenue of the Institute. This would, in the opinion of the Committee, be partly supplied by the increase of membership that would follow the provision of permanent quarters, with increased facilities and privileges. A still larger increase could be provided by increasing the rate of annual dues for resident members, in return for which they would have privileges similar to those of a club. The fixed charges may be approximately and safely estimated (excluding personal services, custodian, etc.,):

Interest, 4 per cent. on $20,000	$ 800
Taxes, insurance and repairs	1,200
	$2,000

Further charges would depend upon the nature of the accommodation and facilities provided. It seems safe to say that $1,000 could be made to cover such house expenses as would be required for the first year.

The Committee by no means recommend limiting the amount proposed to be raised by subscription to $10,000, but consider that it will be within the bounds of prudence to purchase a house when that shall have been reached. They recommend that efforts to secure subscriptions be pressed diligently, and confidently believe that a very large portion, if not the whole, of the sum named ($30,000) can be obtained.

The Committee deem the advantages of having permanent quarters of our own, so obvious as to require no enumeration on their part, and believe that a concerted effort on the part of the members of the Institute will surely lead to success.

They trust that such action will be intitiated at this meeting as will result in the provision of a suitable house, properly fitted for the occupancy of the Institute, at the resumption of its monthly meetings next November.

To that end they advise the passage of a resolution authorizing

and directing the Council to proceed to obtain subscriptions, perfect plans, and report at a special meeting of the Institute, to be called not later than July 1, next.

Signed, GEORGE M. PHELPS, JR., *Chairman.*
T. COMMERFORD MARTIN,
GEORGE A. HAMILTON.
O. E. MICHAELIS.

NEW YORK, May 18, 1887.

MR. PHELPS:—What I have read ends the manuscript of the report—the rest will be verbal. This thousand dollars just mentioned with the two thousand dollars fixed charges proposed, represent an expenditure of three thousand dollars a year, and the committee would say further, that as we begin modestly, we might find it desirable and we think it would be feasible to derive some revenue from the house. For example, the basement story might very probably be rented for some business purpose that would not be disagreeable in its nature—possibly for a restaurant of a good class, which would be rather an advantage; and it has also been suggested that the third story of such a building should be fitted up for dormitories, neatly and comfortably furnished, and that it would be used largely by out-of-town members and their friends at a reasonable charge, say a dollar for a night's lodging; and members have told me to-day that when in town, they would be only too happy to find a room of that character at such a house at their disposal for a dollar per night. It is proper to say further, that a considerable number of members have signified their willingness to subscribe within their ability, outright, a sum of money to be donated for this purpose. In view of what has been presented, the committee would recommend the passage of a resolution at this meeting, authorizing the Council to proceed either by itself or by a committee appointed by it, to take this matter in hand at once, and to endeavor to raise the $10,000 by subscription and to report at a special meeting of the Institute to be called not later than the 1st of July. I believe that is the extent of our work, and in view of the interest that has been expressed at various times within the last three years, since the formation of this Institute, and the very manifest advantages of having a place of our own, where we can be independent and where we can have abundant accommodations; where we will have room for the starting of a laboratory, and for a historical collection and many other similar purposes, all of which will be found useful the moment we have a place; and the additional standing and prestige

that the society will have as soon as it has a habitation of its own, the committee very earnestly recommend the prompt and cordial support of the Institute in making an earnest effort to carry the movement through.

MR. SHELBOURNE:—I move that the report be accepted.

The motion was seconded by Mr. Wheeler, and carried.

THE PRESIDENT:—Having adopted that report, gentlemen, the next thing in order is to have a resolution presented in the shape suggested by the report. I should be very glad to have that resolution put in formal shape immediately.

THE SECRETARY:—I understand that the Committee is to go right on with its work. This is merely a preliminary report, I presume.

THE PRESIDENT:—I understand the report to suggest that it be transferred to the Council, and that the Council summon to its aid all the mind, enthusiasm and weight in the profession to put this thing through.

MR. A. C. FOWLER:—I would like to say that at a meeting of the Electric Club, this same idea was broached about their securing quarters also, and I think it would be a good idea for our Committee to confer with the members of the Electric Club and see if we could amalgamate in some way so that instead of running two small sized establishments we could get together and make one large one. We have a good many members in common, and the Electric Club is a large concern, has a large number of influential members; I presume it has as large, if not a larger membership than we have. I would offer this simply as a suggestion to the Committee appointed here.

THE PRESIDENT:—I think that Mr. Fowler's remarks have our hearty sympathy and support. We move as a national body. This morning the matter was brought up of the amalgamation with the New York Electrical Society, which has an electrical record and which desires, in some way, to affiliate with us. I think if we put ourselves on record to-day as willing to undertake this work, we shall receive the immediate assistance of both bodies and we shall have a home in New York of which all three bodies may be proud. But this movement has been in our hands for three years, and the time has now arrived for us to bring it to a head. I do not think that we can do better than to accept a resolution which I believe Mr. Phelps is now about to offer.

MR. WHEELER:—I think it would be well to get our house

movement well under way and then to take in the Electric Club and the New York Electrical Society. We need not wait until we get the house, but if we get our movement fairly started and it is evident that it is going to be got under way, so that everybody will acknowledge it as a thing sure to be accomplished, then the other societies will be much more easy to manage, and much more glad to join us.

MR. FOWLER:—It strikes me that that would be something like the tail wagging the dog, because I think the Electric Club has a larger membership than this concern, and I do not think that that would be the way to do it.

THE PRESIDENT:—I would like to state to Mr. Fowler that we have had a committee on this subject for three years, and that the work has now fallen into hands that mean business, and we propose to carry this scheme through. Now should there be any such movement in any of the other bodies, why all we want is their help. There are no antagonisms; we are here to serve the common cause, and although I am not aware that Mr. Fowler is speaking as a delegate from any other body, we are glad to have his views on that subject, and are glad to have that information from him.

MR. PHELPS:—Before presenting the resolution I might perhaps state that I do not think the Institute will serve as a very good tail for any dog, and the wagging perhaps will be on the other end; but really there is no conflict whatever. The purposes of the Institute and of the Electric Club are very different; but the establishment of such a headquarters as we have in mind would include within its possibilities the satisfaction of a variety of purposes for which there are now two or three societies, and ultimately it is very likely to result in the amalgamation or co-operation of all these societies. But, as has been very properly said, the first thing to do is to get our place, and the Council seems to be the proper body to take action of this kind as it has frequent meetings and embraces all the officers of the Society. The following resolution has been prepared.

Resolved: That in view of the report of the Committee on Permanent Quarters, the Council be directed to take up the subject and to proceed at once to solicit subscriptions, perfect plans, and to report to a special meeting of the Institute, to be called not later than July 1st.

My idea in presenting it in that form is, that in the next six

weeks or thereabouts, the subject may be considered by the Council; it can use its own methods and appoint a committee or otherwise. Final action ought very properly be made by the Institute as a body, and at any time not later than July first, we could no no doubt, secure sufficient attendance to take proper action.

Captain Michaelis:—In rising to second the motion, I would simply like to say that aside from the strong grounds already presented in favor of this project, it may be considered in another light, and that is from an ethnological standpoint. Man is a gregarious animal; there is no question about that, and I think that the further we advance in civilization and the older we get, we find there is a tendency to come together; in other words, we are "clubable." In all the older countries you find that every man, whatever may be his profession or standing, belongs to some club. That is notably the case in England, and it has got to be so in our country. I am told that here in New York there is not a club in the city whose membership is not full to its constitutional limit, and in some cases hundreds of men are waiting for admission. That principle applies to us. We have here something that induces us to seek companionship and to come together; and having a house of our own in a measure fulfills that innate desire that we have, to become club men and meet. I don't care where it is, gentlemen from the country—I am a gentleman from the country; I live just now in West Troy, which is called the barnyard of America, and that is as good an example of country life as we can get—even in the country you find that state of things prevails. Professional men, and men who are not professional have their Saturday evenings and Wednesday nights to meet here and meet there. There is always this tendency to come together and chat and read papers and do some other things that are not at all disagreeable, and I think that we would find a ready response to anything of the kind, provided that the financial part can be arranged. I do not think that at this early stage of the movement consolidation with any other body need enter the matter at all. I think that all those things will come together perhaps. If our interests are the same we can come together; if our interests vary we will not come together. But I think Mr. Phelps's resolution meets the point. As I understand it, the idea is to give the Council the authority of the Institute to act in its name and do what it may deem best to further it, but the effect of this resolution will be that the Institute as a body commits itself to the idea that there shall be permanent

quarters acquired in whatever way may be deemed best, and I cordially second the resolution.

MR. MAILLOUX:—I have only a few remarks to make in expressing my assent to the resolution as presented. I wish perhaps to say a word of caution by stating that while I am a partisan of aggregation by all means, and not of amalgamation in the sense in which it has been used here, I am also a partisan of assimilation and absorption, though not of the kind of absorption that is spoken of. The American Institute of Electrical Engineers started three or four years ago with a well defined purpose—and it has started with the purpose of being the head of the dog and not the tail of it—and I believe that it is composed of a body of men some of whom are preeminently fitted to be the head of the dog, not only by their scientific attainments, but by their standing in the community as electricians and electrical engineers. I have only to look around me to see such men as Professor Anthony, Professor Thomson, Mr. Frank L. Pope, Mr. George A. Hamilton, and others, who are known to us all in America as electricians, to know that we have got several of the convolutions of the cerebral matter of the brain of that dog. (Applause) Now, gentlemen, I believe that we have not only some of the larger convolutions, but we have also some of the lesser convolutions, and while I appreciate very much the social element I should dislike very much to see the scientific feature of our Institute, which is its foundation, suffer from the introduction of too great a dilution of the social part of it. You all know me, gentlemen, as a practical man—a man whose vocation it is to deal with practical matters; at the same time you all know that I entertain the highest regard for the scientific. I realize that there is not enough of it in this country—that we are not quite as hard students as we should be. Therefore, gentlemen, I say that I am a partisan of aggregation, but I am above all a partisan of assimilation. I am willing that these gentlemen who are interested in electricity because they make money out of it, and are also interested in electricity because they meet very genial people, should join us in social intercourse. And I am also willing that they should come into our body, that we should assimilate them; but I do not look upon our programme for a single moment as one which admits of the proposition for amalgamation with any other body. We have a well-established basis and we have a well-defined programme to pursue, which was laid out for us by the founders of this Institute,

many of whom I see before me, and I do not think that the time has yet come, nor do I think that it ever will come, when it will be necessary for us to swerve from that well-defined line of practice and of principle. (Applause).

MR. SHELBORUNE:—There is just one other aspect of this question which I want to advert to, and that is, that the Institute having started four years ago, started as the American Institute of Electrical Engineers. Now on the principle that the greater includes the less, an American Institute ought to include a New York Electrical Society, or a New York club, and if it comes to a question of absorption, if it comes to a question of uniting under any circumstances or conditions, it would seem appropriate, it would seem the thing to do, that a local organization should come up into the broader and larger organization. This Institute took a position from the first upon the basis of pure electrical science, and it has always been my view that this Institute should be conducted in that spirit and with that motive; that its members or its head should not be associated with any partisan applications of electricity, so as to bring cliques and divisions into this Institute. That has been my view; that has been the motive on which I have acted in connection with this Institute from the beginning.

Now, as I understand, the New York Electrical Society has a membership that is engaged in the practical work of the utilization of electricity. I think it would be appropriate that that Society should not be amalgamated with this nor that we should take the name of the New York Electrical Society, nor the Electrical Section of the American Institute, nor that we should take the name of the New York Electric Club or anything of that sort; but if there is any amalgamation, so called,—which I would rather replace by the word absorption—let the absorption be of the less into the greater, and let that society or that club or any other society or club that is connected with electrical matters come into this Institute under the name of the American Institute of Electrical Engineers.

MR. PHELPS:—Pardon me if I seem arbitrary at all; but the question before us is not at all whether we shall take in any other societies or whether they shall come to us. We have much to do this afternoon; we have many interesting papers to read, and I think we are drifting into a discussion that is quite aside from the point, important as it may be eventually. The question, as I understand it, is whether we shall take any steps towards securing a

building. There may be much expression of opinion to be given as to the desirability of that proposition.

THE PRESIDENT:—Mr. Phelps will appreciate my position; I do not wish to head off any discussion.

MR. FOWLER:—Perhaps my simile about the tail wagging the dog was out of place, and my remarks about the Electric Club were made only for the reason that the Electric Club seems to have been the first club of the kind to make a movement towards getting permanent quarters.

THE PRESIDENT:—We have had a committee of the Institute on this subject for three years.

MR. FOWLER:—The Electric Club have rooms; they pay rent at the Hotel Dam. My reason for not speaking of the New York Electrical Society was that it is now a part of the American Institute.

MR. SHELBOURNE:—I simply want to beg pardon of the meeting for speaking as I did, because I realize that I was not speaking to the question, but my remarks were called forth by that feature of the subject being opened up.

THE SECRETARY:—If Smith wants to buy a house, that is no reason why Jones should not have one to live in as well. There is an old saying that no house is big enough for two families, and I have been through that myself. I say that if we want a house I feel we can have it, and I think that before this meeting is over, we will assure these gentlemen that we will start to get it, and if we make the same progress in three months that we made in three days, we will have a house to move into this fall.

MR. WHEELER:—I think, if we go ahead and secure a house, it will assist in the process of assimilation instead of absorption.

THE PRESIDENT:—The question has been called for; I think it is time now to present it.

(The President read Mr. Phelps's resolution.)

THE SECRETARY:—I have one word to say about this resolution, and that is, that the committee should go right ahead without waiting for the Council at all.

THE PRESIDENT:—I shall immediately invite the expression of the members upon the subject. I think that clinches it.

MR. PHELPS:—I was about to say, Mr. Chairman, that everybody concerned will immediately proceed with this work; and the Council may come together whenever it chooses to take any action that may be deemed necessary at any time. I do not think

that the fact that the Council does not meet until a month from now, need cause any delay.

CAPTAIN MICHAELIS:—I think it might be well if it were added to that resolution, in order to give the committee some status, that this resolution carries with it the vote of the Institute that we have quarters. I think it would be better that we pass a resolution to-day that we are pledged to go into permanent quarters. That would give the committee, when they solicit subscriptions, a stronger position.

THE PRESIDENT:—Suppose we try a resolution of that kind ten minutes hence. Those in favor of the resolution now before the meeting, will express their sentiments by saying aye.

The resolution was carried.

THE PRESIDENT:—That resolution is before you and I presume it means something. We have had a committee for three years, and I have been surprised myself to find the unanimity and enthusiasm of the members on the subject. They all seem determined, every one to whom I have spoken, to secure permanent quarters, and that being the case, there would seem to be no alternative, but to take steps in that direction. If others comes with us, well and good, if not, we move on ourselves. We have the support of leading members of other societies, of whose presence we are proud. We have here Mr. Pendleton of the New York Electrical Society. (Applause.) Shall this resolution fall to the ground to-day or move on. I stand ready to receive any subscriptions to the list that may be now opened.

MR. W. J. JOHNSTON:—Mr. President and Gentlemen: I think that we should go right on with that resolution now. We are all working together for the same object; we do it perhaps in different ways; one invents and another introduces apparatus, and another chronicles what they are doing. There is no question, I think, in the mind of anybody who understands the subject, that this Institute ought to have permanent quarters. It seems to me as if it would give it a standing, that it has not now either in its own country or abroad. I think that if you put the fact of your being a member of this Institute to your name, it should mean something. I am very much pleased with the quarters that this society has; I do not see why we should not have just as good. There is nothing that would give me more pleasure than to help along a movement of this kind, and I take great pleasure in heading the list with five hundred dollars. (Applause.)

MR. FRANK L. POPE:—Mr. Johnston talks business. I will take great pleasure in adding to that, on behalf of the firm which I represent, the sum of two hundred and fifty dollars to start with. (Applause.)

MR. PHELPS:—I took the liberty two days ago when several gentlemen were talking this matter over and trying to be prepared to do something substantial, of communicating with our very good friend and associate, Mr. Frank Morrison, of Baltimore. I addressed him a letter stating to him that we were thinking of doing something of this kind, and that we would be glad to receive a telegram from him the following day, stating what we might put him down for. I received a telegram in reply asking me to put him down for two hundred dollars to start with. (Applause.)

MR. WHEELER:—I have had but since ten o'clock last night to see what I could do, but I will contribute one hundred dollars from our company. We will give more, but I have not had time to talk it over. I will give that amount, however, on my own responsibility. (Applause.)

MR. PHELPS:—I might say, Mr. Chairman, that I can tender on the part of my father, one hundred dollars, and on the part of myself, one hundred dollars. (Applause.)

THE PRESIDENT:—The President is not a moneyed man, but he has the interest of the Institute and electrical science at heart, and I wish to put my name down for a hundred dollars, with liberty to increase. (Applause.)

THE SECRETARY:—The Treasurer has been heard from. I intended to speak with the gentleman with whom I am associated, Mr. Clark B. Hotchkiss, representing Austin G. Day, who, as you all know, has been making insulated wire for twenty-five years, and I presume, when the proper time comes, he will do at least what I do, and I feel an intense interest in this, as a kind of stimulus to the work of the Secretary. The Secretary has to do a good deal of work, and it is rather hard sledding when he is not supported, and in order to help the thing along, I want to put myself abreast of the President and Treasurer at least, and you can put me down for a hundred dollars. (Applause.)

MR. WETZLER:—Mr. President, I would like to contribute my little mite of a hundred dollars. (Applause.)

THE PRESIDENT:—It seems to me, gentlemen, that we are getting a pretty good expression of feeling on this subject. We

evidently mean business. I might say that I have information from my good friend, Mr. Clarence E. Stump, that he wishes to chip in to the extent of a hundred dollars.

MR. PHELPS:—That seems to make about $1,650 so far.

THE PRESIDENT:—In ten minutes.

MR. PHELPS:—We said, I think, in our report, that we thought the Institute itself would raise somewhere from three to five thousand dollars, so we seem to have got half way to the minimum now.

THE PRESIDENT:—There are some members, perhaps, who may not feel at present that they can contribute to such an extent. It seems to me that we shall easily reach the limit that Mr. Phelps appears to have fixed. I shall be very glad to hear any expression of sentiment that while it may not reach the extent of a hundred dollars, yet shows full support and sympathy with the movement.

MR. FRANK L. POPE:—I think, Mr. President, that we may feel that the more money we raise in the Institute the greater amount we can get outside. People are always more willing to aid those who show a disposition to help themselves. I think we shall have very little trouble in raising the rest of it.

THE PRESIDENT:—It seems to me, Captain Michaelis, that your motion would now be in order—that we get a house. (Laughter.) Our good friend, Mr. Bogart, at the door, has gone through just this experience.

PROFESSOR ANTHONY: I have been waiting for the hundred dollar men to get through. College professors, perhaps, cannot be expected to go so far as men who are working commercially, but I will be glad to put in fifty dollars. (Applause.)

THE PRESIDENT: I think that college professors are the poorest paid class of men in this country, considering what they do to promote our best interests, and I regard that as a noble contribution, and one which will be appreciated by the Institute to the full.

CAPTAIN MICHAELIS:—I am an army officer and cannot do quite as well as a college professor, but I received a note from eight little Michaelises, and they each said they would give two dollars and a half towards this movement. (Applause)

THE PRESIDENT:—The limit may be raised. Do you wish to make the motion you spoke of, Captain Michaelis?

CAPTAIN MICHAELIS:—I think, Mr. President, that the Insti-

tute has already expressed itself very decidedly on the matter, and I do not think any further motion will be necessary.

The regular programme of the afternoon session of the general meeting was then resumed, beginning with a paper by Professor Elihu Thomson. (See volume iv of the Transactions.)

At the close of the afternoon session of the general meeting the following resolution was introduced by the Secretary:

Resolved: That the sincere and heartfelt thanks of the American Institute of Electrical Engineers be and are hereby extended to the American Society of Civil Engineers, and its able and hospitable secretary, Mr. John Bogart, and his assistants, for their continued favors and courtesy tendered to us, beginning with the organization of this society, and continued during its progress toward its final establishment upon a firm and enduring basis.

Resolved: That whereas imitation is the sincerest form of approbation, that we pledge our efforts to exercise our means and energies to the immediate establishment of a home of our own, to which we hope hereafter to extend our hospitality to all engineers of every branch who may desire to avail themselves of the information developed as the introduction of electric industries grows in public importance.

The resolution was adopted.

THE SECRETARY:—I also beg leave to offer the following resolution:

Resolved: That the members and associates of the American Institute of Electrical Engineers, as a slight appreciation of the courtesies extended to us by Mr. Erastus Wiman, President of the Telemeter Company, and Mr. C. C. Martin, Chief Engineer of the East River Bridge, do hereby extend their hearty thanks for the thoughtfulness and hospitality of those gentlemen in providing for a most enjoyable scientific and social entertainment in connection with their annual meeting.

The resolution was adopted.

MR. MAILLOUX:—I would like to call attention to the fact that no action has been taken yet to perpetuate the arrangement in vogue last year for monthly meetings.

THE PRESIDENT:—It is within the discretion of the Council.

MR. MAILLOUX:—It was intended to have some amendment to the Constitution at this meeting, was it not?

THE PRESIDENT:—It was found that no action was necessary.

The general meeting then adjourned.

Business transacted at the meeting of the American Institute of Electrical Engineers at 136 5th Avenue, June 28th, 1887.

THE PRESIDENT:—The business of the evening, as you are aware, is the reading of a paper by Mr George W. Blodgett, on Electrical Train Lighting, and we shall have much pleasure in listening to that paper. But before doing so, in accordance with a resolution passed at our last meeting, the Committee on Permanent Quarters has a report to make, and I will therefore call for Mr. George M. Phelps, Jr., Chairman of that Committee, to make a report.

MR. PHELPS:—Mr. Chairman and gentlemen, it will take but a moment to say all we have to say. The committee has succeeded reasonably well in its work so far. Circumstances have prevented our having so fully matured a plan to report as we might have wished. In the first place, as to the subscriptions since the annual meeting. The subscriptions now amount among the membership, with very few exceptions, to between $4,400 and $4.500, and, in addition to that, I may say there is virtually pledged a single subscription of $1,000 by a prominent gentleman whose name we are not at liberty to announce; but we are so confident of the matter, that I can say we have the expectation that the subscriptions have reached about $5,500 towards the $10,000, at which figure we fixed the minimum amount.

With respect to getting a house, we found very hearty co-operation on the part of the Society of Civil Engineers. They invited us to meet a committee of their body and to confer as to joint action, as they needed more room. Their suggestion was that we might combine our efforts and resources with theirs and they have evinced a very cordial spirit. Mr. Worthen, the President of the Civil Engineers, said that he regarded the Electrical Engineers as a branch of the general body of Civil Engineers, and had set his mind and heart upon having us with them in some distinct and permanent fashion, and the first plan proposed, and the plan to which we gave some attention for a week or two, was to get possession, either ourselves or the Civil Engineers, it matters not which perhaps, of the building adjoining the Civil Engineers in Twenty-third street, with a view of having a common audience room which both societies could use, and then dividing the rest of the room between us in some suitable manner. But we found it was of no use to work on that line, because the house absolutely could not be bought. Since then, in consequence

of the very cordial desire manifested by the Civil Engineers, that we should work with them in some way, we have abandoned for the present any attempt to select or purchase a house of our own in any locality; that is to say, we think it is possible by further conference with the Civil Engineers to work to some such plan as this: The purchase of a suitable amount of land somewhere and the erection of a building large enough to accommodate both societies and possibly also the Mechanical Engineers. The members will perceive in this suggestion some resemblance to the scheme which was occasionally outlined by Col. Hazard, who was on the old Committee on Permanent Quarters. The idea has always been a good one, and the Committee are of the opinion, that there is a reasonable prospect of our carrying out a programme of that kind after a further conference with the Society of Civil Engineers and their committee. That is the present state of the matter. There is no definite programme on hand for the purchase of any particular house, and we are going on from day to day and from week to week in adding to the subscription list with the view of carrying out such a plan as I have indicated.

I might say one word in particular, germane to the work of this committee, that it is very gratifying to observe the growth in membership that has taken place since the last annual meeting. Forty new members have been added, and I understand there are twenty-five to be acted upon at the next council meeting.

Vol. I, 1884.

Historical Preface. Notes on Phenomena in Incandescent Lamps. (Illustrated.) Prof. Edwin J. Houston of Philadelphia.
Underground Wires. (Illustrated.) W. M. Callender of New York.
Synchronism. (Illustrated.) Prof. Edwin J. Houston of Philadelphia.
The Delany Synchronous Multiplex System of Telegraphy. (Illustrated.) Prof. Edwin J. Houston of Philadelphia.
The Scientific City Street. (Illustrated.) Col. Rowland R. Hazard of N. Y.
An Experimental Method of Studying the Dynamo Machine. By Prof. C. F. Brackett, of Princeton, N. J.
Earth Wires; or the Earth as an Electric Circuit Completer. Thomas D. Lockwood, Boston, Mass.
Telegraphing without Wires—An Experiment. (Illustr.) S. J. M. Bear.
Chemistry of the Carbon Filament. Edward P. Thompson, of New York.
Depositing Vats in "Series." H. B. Slater, now of Detroit, Mich.
The Patent Office; its Relation to Inventors and its Needs. C. J. Klntner, now of New York.

Vol. II, 1885.

The Protection of Electrical Inventions. F. Jannus, of Wash'n, D. C.
Cost of Mine Lighting. Frank P. Mills, now of Ishpeming, Mich.
The Electric Arc Lamp Frictional Clutch. (Illustrated.) By Edward P. Thompson of New York.
Description of a Large Secondary Battery Plant for General Commercial Distribution. E. P. Roberts, of Cheyenne, Wyo.
Delany's System of Fac Simile Telegraphy. (Illustrated.) Prof. Edwin J. Houston of Philadelphia.

Vol. III, 1886.

Underground Electrical Systems. By Sidney F. Shelbourne.
The Great Tangent Galvanometer of the Cornell University. Prof. W. A. Anthony, now of Manchester, Conn.
Some Recent Advances in Telephony. (Illustrated.) Thomas D. Lockwood, of Boston, Mass.
The Patent Office and Patent Office Practice. A. C. Fowler, of N. Y.
Static Difficulties in Telegraph Wires. F. W. Jones of New York. Containing a Synopsis, with reference to 118 American and Foreign Patents for Inventions intended to overcome these difficulties.
Secondary Batteries for Light and Power. A. H. Bauer.
The Wire Gauge. Report of Committee.
Notes on Dynamic Induction. Sidney F. Shelbourne.

Vol. IV, 1887.

Electric Street Cars. T. C. Martin, of New York.
The Practical Requirements of Small Motors. S. S. Wheeler, of N. Y.
Distribution of Electricity by Secondary Generators. Discussion by F. L. Pope, Dr. Otto A. Moses, Captain O. E. Michaelis, Prof. Elihu Thomson and others.
Storage Batteries in Practice. E. P. Roberts of Cheyenne, Wyo.
Differing Temperature Coefficients of the Different Coils of a Fine Rheostat. Prof. W. A. Anthony, now of Manchester, Conn.
On the Best Ratio of the Section of the Gramme Armature to the Section of the Field Magnets. (Illustrated.) Dugald C. Jackson, now of Lincoln, Neb.
Novel Phenomena of Alternating Currents. (Illustrated.) Prof. Elihu Thomson, of Lynn, Mass.
A Few Comparative Statistics of Electric Railways. T. C. Martin, of New York. (With tabular statement.)
Central Station Construction. J. A. Powers, of Troy, New York.
On the Change from Negative to Positive of the Temperature Coefficients of some Carbon Filaments. (Illustrated.) Prof. W. A. Anthony, of Manchester, Conn.
Lead Encased Conductors. (Illustrated.) David Brooks, of Philadelphia.
The Electric Lighting of Passenger Trains. (Illustrated.) Geo. W. Blodgett, of Boston.

Vol. V, 1887. (Now being published in monthly numbers.)

On Electric Street Cars, with special reference to Methods of Gearing. Anthony Reckenzaun, of London. No. 1, October, 1887.
A Coulomb Meter, or Instrument for Measuring the Consumption of Electricity. (Illustrated.) Prof. George Forbes, F.R.S., of London. No 2, November, 1887.

AMERICAN INSTITUTE

OF

ELECTRICAL ENGINEERS.

RULES ADOPTED MAY 15, 1884.
AMENDED DECEMBER 8, 1885.

EXECUTIVE OFFICES,
Pearl & Cedar Sts., Franklin Square, New York.

American Institute of Electrical Engineers.

FOUNDED 1884.

RULES.

AMENDED DECEMBER 8, 1885.

I.

OBJECTS.

The objects of the AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS are to promote the Arts and Sciences connected with the production and utilization of electricity, and the welfare of those employed in these industries; by means of meetings for social intercourse, the reading and discussion of professional papers, and the circulation, by means of publications among its members and associates, of the information thus obtained.

II.

MEMBERSHIP.

The Institute shall consist of Members, Honorary Members, and Associates. Members shall be Electrical Experts, Electricians, or Electrical Engineers possessing such knowledge of the principles of Electrical science and such familiarity with the practical applications of electricity in its several branches as those branches imply.

Honorary members shall be recommended by at least ten members or associates, and elected by the unanimous vote of the Council, but shall not be entitled to vote or serve as members of the Council.

Associate members shall be such persons as are or have been connected with the utilization of electricity, or who by

means of study or experimental investigation are qualifying themselves to become identified with electrical science, and such others to whose admission no objection shall be made by any member of the Council.

Proposals for admission shall be endorsed by at least three members or associates, and referred to the Council, which shall have power to elect to Associate membership only.

All members and associates shall be equally entitled to the privileges of membership.

Transfers from associate membership to membership may be made by the Council upon application, subject to the approval of a Board of Examiners, which shall have the power from time to time to provide rules to test the qualifications of applicants. Such rules must be approved by the Council. Any person rejected by the Board shall have the right of appeal first to the Council, and finally to any meeting of the Institute.

The Board of Examiners shall consist of five members (three of whom shall constitute a quorum), who shall be appointed by the President and approved by the Council. They may not be members of the Council, and at least three of them must reside within convenient distance of New York City.

Any member or associate may be stricken from the list by the vote of three-fourths of the members of the Council, due notice having been mailed in writing by the Secretary to the said member or associate.

III.

DUES.

The entrance fee shall be five dollars for each person. The dues of members and associates shall be ten dollars per annum, payable in advance, at the annual meeting, except that new associate members elected shall pay in advance, *pro rata*, from the first of the month of their election until the next annual meeting. Honorary members shall not be liable to fees and

dues. Any member or associate may become, by the payment of one hundred dollars at any one time, a life member or associate, and shall not be liable thereafter to annual dues. The dues of members residing in foreign countries—beyond the seas—shall be five dollars per year, but such members shall have no vote for election of members. Any member or associate in arrears may, at the discretion of the Council, be deprived of the receipt of publications, or stricken from the list of members when in arrears for one year; *Provided*, that he may be restored to membership by the Council on payment of all arrears, or by re-election after an interval of three years.

IV.

OFFICERS.

The affairs of the Institute shall be managed by a Council, consisting of a President, six Vice-Presidents, twelve Managers, a Secretary and a Treasurer, who shall be elected from among the members and associates of the Institute at the annual meetings, to hold office as follows:

The President, the Secretary and the Treasurer for one year (and no person shall be eligible for immediate re-election as President, who shall have held that office subsequent to the adoption of these rules for two consecutive years), the Vice-President for two years, and the Managers for three years; and no Vice-President or Manager shall be eligible for immediate re-election to the same office at the expiration of the term for which he was elected. At each annual meeting a President, three Vice-Presidents, four Managers, a Secretary and a Treasurer shall be elected, and the term of office shall continue until the adjournment of the meeting, at which their successors are elected.

At the first meeting for the election of officers, a President, three Vice-Presidents to serve one year; three Vice-Presidents to serve two years; four Managers to serve one year; four Managers to serve two years; four Managers to serve three

years; a Treasurer to serve one year, and a Secretary to serve one year, shall be elected.

The duties of all officers shall be such as usually pertain to their offices, or may be delegated to them by the Council or the Institute; and the Council may, in its discretion, require bonds to be given by the Treasurer. At each annual meeting the Council shall make a report of proceedings to the Institute, together with a financial statement.

Vacancies in the Council may occur by death or resignation; or the Council may, by a vote of the majority of all its members, declare the place of any officer vacant, on his failure for one year, from inability or otherwise, to attend the Council meetings or to perform the duties of his office. All vacancies shall be filled by the appointment of the Council, and any person so appointed shall hold office for the remainder of the term for which his predecessor was elected or appointed; *Provided*, that the said appointment shall not render him ineligible at the next annual meeting.

Five members of the Council shall constitute a quorum; but the Council may appoint an Executive Committee, or business may be transacted at a regularly called meeting of the Council, at which less than a quorum is present, subject to the approval of a majority of the Council, subsequently given in writing to the Secretary and recorded by him with the minutes.

V.

ELECTIONS.

The annual election shall be held in the city of New York on the third Tuesday in May of each year. Nominations for officers may be made in writing to the Secretary at any time previous to the meeting, but the votes shall be by ballots deposited only by members actually present; *Provided*, that no member or associate in arrears since the last annual meeting shall be allowed to vote until the said arrears shall have been paid. If for any reason it is deemed proper to postpone the

election, it may be adjourned from day to day with the consent of two-thirds present or voting.

VI.

MEETINGS.

The annual meeting of the Institute shall take place on the third Tuesday of May, at which a report of the proceedings of the Institute, and an abstract of the accounts, shall be furnished by the Council. Two other regular meetings of the Institute shall be held in each year at such times and places as the Council shall select, and notice of all meetings shall be given by mail or otherwise, to all members and associates, at least twenty days in advance. Special meetings may be called whenever the Council sees fit, and the Secretary shall call a special meeting on a requisition signed by fifteen or more members. The notices for special meetings shall state the business to be transacted, and no other shall be entertained.

Every question which shall come before any meeting of the Institute shall be decided, unless otherwise provided by these rules, by the votes of a majority of the members then present. Any member or associate may introduce a stranger to any meeting, but the latter shall not take part in the proceedings without the consent of the meeting.

VII.

PAPERS.

The Council shall have power to decide on the propriety of communicating to the Institute any papers which may be received, and they shall be at liberty, when they think it desirable, to direct that any paper read before the Institute shall be printed in the Transactions. Intimation, when practicable, shall be given at a general meeting of the subject of the paper or papers to be read, and of the questions for discussion at the next meeting. The reading of papers shall not be delayed beyond such hour as the presiding officer shall think proper;

and the election of members or other business may be adjourned by the presiding officer, to permit the reading and discussion of papers.

The copyright of all papers communicated to, and accepted by, the Institute, shall be vested in it, unless otherwise agreed between the Council and the author. The author of each paper read before the Institute shall be entitled to twelve copies, if printed, for his own use, and shall have the right to order any number of copies at the cost of paper and printing, provided said copies are not intended for sale. The Institute is not, as a body, responsible for the statement of facts or opinions advanced in papers or discussions at its meetings, and it is understood that papers and discussions should not include matters relating to politics or purely to trade.

VIII.

AMENDMENTS.

These Rules may be amended at any regular meeting by a two-third vote of the members present, provided that written notice of the proposed amendment shall have been given at a previous meeting.

STATE OF NEW YORK.)
CITY AND COUNTY OF NEW YORK,) ss.

I, Sidney F. Shelbourne, having been appointed a committee of one at a meeting of the American Institute of Electrical Engineers, held in the City of New York, on the 8th day of December, 1885, to supervise and attend to the correct engrossing and embodiment into the Rules of the Institute of the amendments thereto, adopted at said meeting, do hereby certify that the foregoing Rules, as printed, correctly contain, under their several divisions, the said amendments and the whole thereof, as adopted at said meeting.

Dated New York City,
The 27th day of January, 1886.

SIDNEY F. SHELBOURNE.